

To: Way, Steven[way.steven@epa.gov]
Cc: Allen Sorenson[allen.sorenson@state.co.us]
From: Stover - DNR, Bruce
Sent: Thur 6/5/2014 7:44:36 PM
Subject: Re: Gold King - Portal / Structural sets - steel rings

Steve,

I've continued to think about your rings/arches....Another thing to consider is the size of the arch/ring you have access to...you can't really change their intended diameter as they are pre-formed, so you have to develop the heading to the proper dimension to allow the arches/rings to fit fairly tight to the excavation. If they are too small for the re-habbed opening you have to do a lot of cribbing above and on the ribs, which is time consuming and less functional/desirable than a close fit; if they are too big for the re-habbed opening, you'll have to be slabbing and slicing rock obstructions etc to get them to fit! Otherwise you'll be cutting and welding and custom fitting the arches which is defeating their advantages.

This is why we don't usually use them in re-hab work... they are expensive and sometimes we don't know the size of excavation we are going to end up with, so it's usually cheaper to custom fit and weld square-sets out of common steel beams to the size of site-specific support elements we need, instead of messing with a lot of cribbing and bracing if the preformed stuff is too small, or slabbing/blasting make the arches/rings fit properly if they are to big.

All that being said, if the arches/rings you have are sized properly for the headings in the Gold King (which is what I assume they were originally intended for?), than you'll be way ahead of the game, and they should be the way to go. Todd should be able to confirm this for you.

On Thu, Jun 5, 2014 at 12:02 PM, Way, Steven <way.steven@epa.gov> wrote:

Bruce,

Thanks for the information – that helps clarify some things. I guess I need to circle back with Todd regarding the bracing components.

Steve

From: Stover - DNR, Bruce [<mailto:bruce.stover@state.co.us>]
Sent: Thursday, June 05, 2014 11:03 AM

To: Way, Steven
Cc: Sorrenson - DNR, Allen
Subject: Re: Gold King - Portal / Structural sets - steel rings

Steve,

These are pre-curved (formed or rolled) steel beams with end plates that are bolted together to form either an arch "cap" section set on straight steel beam "posts"/legs, or alternatively, a full 360-degree circular "ring" to support the entire circumference of the heading in really soft of squeezing ground.

Once the arches or rings are bolted in place, heavy lagging is placed into the slots along the ribs and back formed by the beam webs/flanges to support the back and ribs in between each set or ring. There are also usually steel braces bolted between each set or ring, usually at collar and knee level.

This system is pretty "Cadillac" for AML investigations- its much more expensive than standard straight steel beam stock used to make steel "square-sets", but it has much better weight holding capacity per lb of steel due to the higher strength of the arch/ ring geometry. If you can get your hands on this stuff for free, it should be the way to go.

The length of your advance with a given number of sets/rings will depend on ground conditions, which will dictate the necessary spacing between each set/ring for the wood lagging to sufficiently support the back and ribs in between.

On Thu, Jun 5, 2014 at 10:37 AM, Way, Steven <way.steven@epa.gov> wrote:

Bruce and Allen,

What is your experience with or knowledge of using steel “lining rings” to create the portal structure supports? Apparently, there is enough for 100 ft, if we provide the lagging.

Thanks,

Steve

P.S. apparently the newer adit has the draining / pipe closure and the older adit is a lower elevation.

Steven Way

Federal On-Scene Coordinator

Emergency Response Unit

US EPA - Region 8

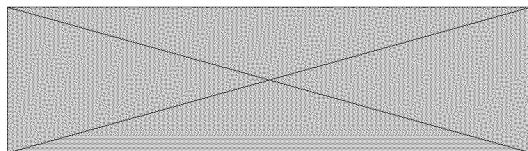
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Bruce K. Stover
Director
Inactive Mine Reclamation Program

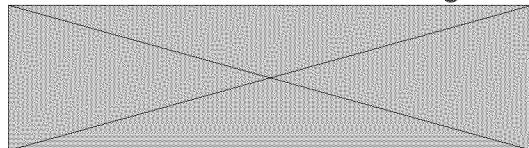


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